

=> FIL REG  
FILE 'REGISTRY' ENTERED AT 13:55:53 ON 26 JAN 2010  
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EIC Search (Part I)  
MRY

=> D HIS  
FILE 'HCAPLUS' ENTERED AT 12:24:38 ON 26 JAN 2010  
E US 2005-540732/APPS  
L1 1 S E3  
E GB2002-0230076/APPS  
E GB2002-02300762/APPS  
E WO2003-GB05660/APPS  
L2 1 S E3-E4  
L3 1 S L1-L2  
SEL L3 RN

FILE 'REGISTRY' ENTERED AT 12:25:58 ON 26 JAN 2010  
L4 6 S E1-6

FILE 'HCAPLUS' ENTERED AT 12:27:31 ON 26 JAN 2010  
E KATHIRGAMANATHAN P/AU  
L5 137 S E3-E4  
E PRICE R/AU  
L6 107 S E3  
E PRICE RICHARD/AU  
L7 22 S E3  
E E GANESHAMURUGAN S/AU  
E GANESHAMURUGAN/AU  
L8 26 S E4 OR E6  
E PARAMASWARA G/AU  
L9 14 S E3-E4  
L10 260 S L5-L9  
E ELAM T LIMITED/CO  
E ELAM T LIMITED/CO  
E E3+ALL  
L11 35 S E2/CO,CS,PA  
E NUKO 70 LIMITED/CO  
E E2+ALL  
E NUKO 70/CO  
E E2+ALL  
E NUKO 70 LIMITED/CO  
L12 4 S E3  
E MERCK PATENT GMBH/CO  
E E3+ALL  
L13 1645 S E1-E2/CO,CS,PA  
L14 1684 S L11-L13

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L15 STR

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L16 9 S L15

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L17 STR

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L18 0 S L17

FILE 'LREGISTRY' ENTERED AT 12:54:19 ON 26 JAN 2010  
L19 STR

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L20 50 S L19

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L21 STR

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L22 25 S L21

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L23 STR L21

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L25 STR L23

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L27 STR

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L28 0 S L27

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L29 STR L27

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L30 25 S L29

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L31 STR L27

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L32 9 S L31

FILE 'LREGISTRY' ENTERED AT 13:35:33 ON 26 JAN 2010  
L33 STR L31

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L34 0 S L33

L35 SCR 478 OR 484

L36 STR L33

L37 STR

L38 2 S L36 AND L37

L39 STR L37

L40 0 S L36 AND L39

L41 SCR 1918

L42 10 S L36 AND L41

L43 0 S L36 AND L39

L44 2 S L36 AND L39 AND L41

L45 732 S L36 AND L39 AND L41 FUL  
SAV L45 YAM732/A

January 26, 2010

10/540,732

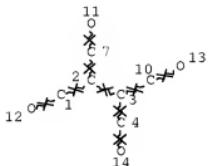
3

L46 11 S L45 AND 2/IR

FILE 'HCAPLUS' ENTERED AT 13:52:20 ON 26 JAN 2010  
L47 6 S L46  
L48 1 S L47 AND (L10 OR L14)  
L49 5 S L47 NOT L48

FILE 'REGISTRY' ENTERED AT 13:55:53 ON 26 JAN 2010

=> D L46 QUE STAT  
L36 STR



DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE

L39 STR

M 2 M 1

NODE ATTRIBUTES:

NSPEC IS RC AT 1  
NSPEC IS RC AT 2  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 2

STEREO ATTRIBUTES: NONE

SCR 1918  
L41 732 SEA FILE=REGISTRY SSS FUL L36 AND L39 AND L41  
L46 11 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON L45 AND 2/IR

=> FIL HCAP  
 FILE 'HCAPLUS' ENTERED AT 13:56:10 ON 26 JAN 2010  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
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=> D L48 1 IBIB ABS HITSTR HITIND RETABLE

L48 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2004:566626 HCAPLUS Full-text  
 DOCUMENT NUMBER: 141:131022  
 TITLE: Electroluminescent materials and devices using a  
       diiridium acetylacetonate complex  
 INVENTOR(S): Kathirgamanathan, Poopathiy; Price,  
       Richard; Ganeshamurugan, Subramanian  
       ; Paramaswara, Gnanamoly  
 PATENT ASSIGNEE(S): Elam-T Limited, UK  
 SOURCE: PCT Int. Appl., 50 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

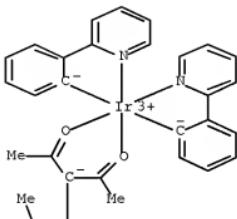
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004058783	A1	20040715	WO 2003-GB5660	20031223
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KE, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003290340	A1	20040722	AU 2003-290340	20031223
EP 1578756	A1	20050928	EP 2003-782699	20031223
EP 1578756	B1	20070613		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2006512388	T	20060413	JP 2004-563367	20031223
AT 364612	T	20070715	AT 2003-782699	20031223
US 20060269778	A1	20061130	US 2005-540732	20050725
PRIORITY APPLN. INFO.:			GB 2002-30076	A 20021224
			WO 2003-GB5660	W 20031223

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

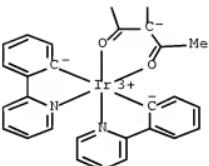
AB The invention refers to an organic diiridium acetylacetonate complex used as  
   an electroluminescent compound in electroluminescent devices.  
 IT 722503-96-0P  
       (electroluminescent materials and devices using diiridium  
       acetylacetonate complex)  
 RN 722503-96-0 HCAPLUS

CN Iridium, [ $\mu$ -(3,4-di(acetyl- $\kappa$ O)-2,5-hexanedionato(2-)- $\kappa$ O: $\kappa$ O')]tetrakis[2-(2-pyridinyl- $\kappa$ N)phenyl- $\kappa$ C]di- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



IC ICM C07F0015-00

ICS C09K0011-06; H05B0033-14; H01L0051-30

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 29

IT 722503-96-0P

(electroluminescent materials and devices using diiridium acetylacetone complex)

RETABLE

Referenced (RAU)	Author	Year (R PY)	VOL (R VL)	PG (R PG)	Referenced Work (R WK)	Referenced File
Anon					WO 0202714 A2	HCAPLUS
Anon					EP 1348711 A1	HCAPLUS

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS

=> D L49 1-5 IBIB ABS HITSTR HITIND RETABLE

L49 ANSWER 1 OF 5 HCPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2009:1527235 HCPLUS Full-text  
TITLE: Syntheses and Reactions of Half-Sandwich Iridium,  
Rhodium, and Ruthenium Metallacycles Containing  
4-Pyridyl Dithioether Ligands  
AUTHOR(S): Jia, Ai-Quan; Han, Ying-Feng; Lin, Yue-Jian; Jin,  
Guo-Xin  
CORPORATE SOURCE: Shanghai Key Laboratory of Molecular Catalysis and  
Innovative Material, Department of Chemistry,  
Fudan University, Shanghai, 200433, Peop. Rep.  
China  
SOURCE: Organometallics (2010), 29(1), 232-240  
CODEN: ORGND7; ISSN: 0276-7333  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Metallacyclic complexes [ $Cp^*4Ir4(\mu-L')2(\mu-L)2](OTf)4$  (2a,  $L' = 6,11$ -dioxy-  
5,12-naphthacenedione (dhnq2-);  $L = 4$ -pyridyl dithioether), [ $Cp^*2Rh2(\mu-L')(\mu-L)](OTf)2$  (3b), and [ $(p$ -cymene) $2Ru2(\mu-L')(\mu-L)](OTf)2$  (3c) were obtained by  
the reactions of  $Cp^*2M2(\mu-L')C12$  ( $M = Ir$  (1a),  $Rh$  (1b)) or ( $p$ -cymene) $2Ru2(\mu-$   
 $L')C12$  (1c) with a flexible bipyridine-based ligand ( $L$ ) in the presence of  
 $AgOTf$  ( $OTf = CF3SO3$ ). Treatments of tetrานuclear complex 2a and binuclear  
complexes 3b and 3c with [ $Cp^*IrCl]2(OTf)2$  or [ $Cp^*RhCl]2(OTf)2$  gave the  
homotrinuclear complexes [ $Cp^*3Ir3(\mu-L')(\mu-L)Cl](OTf)3$  (4a) and [ $Cp^*3Rh3(\mu-$   
 $L')(\mu-L)Cl](OTf)3 (4b) and heterotrinuclear complexes [ $Cp^*3Ir2Rh(\mu-L')(\mu-$   
 $L)Cl](OTf)3 (4c), [ $Cp^*3Rh2Ir(\mu-L')(\mu-L)Cl](OTf)3 (4d), [ $Cp^*(p$ -cymene) $2Ru2Ir(\mu-$   
 $L')(\mu-L)Cl](OTf)3 (4e), and [ $Cp^*(p$ -cymene) $2Ru2Rh(\mu-L')(\mu-L)Cl](OTf)3 (4f),  
resp. The flexible tetrานuclear complex 2a exhibited different conformations  
with different guest solvents. The complexes were characterized by IR, 1H NMR  
spectroscopy, and elemental anal. In addition, x-ray structure analyses were  
performed on ligand  $L$  and complexes 2a, 3c, 4a, and 4e.$$$$$

IT 1190934-87-2  
(preparation and reactions of half-sandwich iridium, rhodium, and  
ruthenium metallacycles containing dioxy naphthacenedione and pyridyl  
dithioether ligands)

RN 1190934-87-2 HCPLUS  
CN INDEX NAME NOT YET ASSIGNED

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 1203454-78-7P  
(preparation and reactions of half-sandwich iridium, rhodium, and  
ruthenium metallacycles containing dioxy naphthacenedione and pyridyl  
dithioether ligands)

RN 1203454-78-7 HCPLUS  
CN INDEX NAME NOT YET ASSIGNED

CM 1

CRN 1203454-77-6  
CMF C60 H65 Cl Ir2 N2 O4 Rh S2  
CCI CCS

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 37181-39-8  
CMF C F3 O3 S

CC 29-13 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 27, 75  
 IT 4556-23-4, 4-Pyridinethiol 12354-84-6,  
 Bis[dichloro( $\eta^5$ -pentamethylcyclopentadienyl)iridium] 12354-85-7,  
 Bis[dichloro( $\eta^5$ -pentamethylcyclopentadienyl)rhodium] 1190934-87-2 1190934-88-3 1203454-67-4  
 (preparation and reactions of half-sandwich iridium, rhodium, and ruthenium metallacycles containing dioxynaphthacenedione and pyridyl dithioether ligands)  
 IT 1203454-74-3P 1203454-78-7P 1203454-82-3P  
 1203455-01-9P  
 (preparation and reactions of half-sandwich iridium, rhodium, and ruthenium metallacycles containing dioxynaphthacenedione and pyridyl dithioether ligands)

## RETABLE

Referenced (RAU)	Author	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Work	Referenced File
Bennett, M		1974	1	123	J Chem Soc, Dalton T	HCAPLUS	
Boyer, J		12007	140	1233	Acc Chem Res		HCAPLUS
Boyer, J		12007	140	1233	Acc Chem Res		HCAPLUS
Chatterjee, B		12004	126	10645	J Am Chem Soc		HCAPLUS
Clegg, J		2008	1	1331	Dalton Trans		HCAPLUS
Dobrzanska, L		2005	127	13134	J Am Chem Soc		HCAPLUS
Espinet, P		2000	1	1915	Chem Commun		HCAPLUS
Fish, R		2003	122	2166	Organometallics		HCAPLUS
Fujita, M		2005	138	369	Acc Chem Res		HCAPLUS
Fujita, M		1996	1	1535	Chem Commun		HCAPLUS
Ghosh, S		2008	147	13403	Angew Chem, Int Ed		HCAPLUS
Gibson, V		12000	119	14425	Organometallics		HCAPLUS
Govindaswamy, P		2006	1	14691	Chem Commun		HCAPLUS
Han, W		2004	1	1656	Dalton Trans		
Han, Y		12009	148	16234	Angew Chem, Int Ed		HCAPLUS
Han, Y		2008	1	1350	Chem Commun		HCAPLUS
Han, Y		2009	138	13419	Chem Soc Rev		HCAPLUS
Han, Y		2008	1693	1546	J Organomet Chem		HCAPLUS
Heo, J		2007	129	17712	J Am Chem Soc		HCAPLUS
Jiang, H		2003	125	18084	J Am Chem Soc		HCAPLUS
Kaes, C		2000	100	13553	Chem Rev		HCAPLUS
Lee, C		2009	148	16329	Inorg Chem		HCAPLUS
Liu, S		2007	1	1543	Chem Soc Rev		HCAPLUS
Maji, T		2005	127	17152	J Am Chem Soc		HCAPLUS
Mimassi, L		2007	126	1860	Organometallics		HCAPLUS
Plater, M		2000	1	13065	J Chem Soc, Dalton T	HCAPLUS	
Rasika Dias, H		2005	127	17489	J Am Chem Soc		

Rishikesh, P	2009	1362	13219	Inorg Chim Acta	
Romero, F	1996		1551	Chem Commun	HCAPLUS
Sathyendiran, M	2007		1872	Dalton Trans	HCAPLUS
Sautter, A	2001	123	15424	J Am Chem Soc	HCAPLUS
Schnebeck, R	1999		1675	Chem Commun	HCAPLUS
Schweiger, M	2001	40	13467	Angew Chem, Int Ed	HCAPLUS
Sekioka, Y	2005	23	18173	Inorg Chem	
Severin, K	2006		13859	Chem Commun	HCAPLUS
Severin, K	2003	245	3	Coord Chem Rev	HCAPLUS
Su, C	2003	125	18595	J Am Chem Soc	HCAPLUS
Sun, S	2000	122	18956	J Am Chem Soc	HCAPLUS
Suzuki, H	2000		1801	Chem Commun	HCAPLUS
Swiegers, G	2000	100	13483	Chem Rev	HCAPLUS
Takata, D	2008	20	1922	Chem Mater	
Therrien, B	2008	47	13773	Angew Chem, Int Ed	HCAPLUS
Uemura, K	2006	128	16122	J Am Chem Soc	HCAPLUS
Wang, J	2004	49	1122	Chin Sci Bull	HCAPLUS
Wang, J	2006	25	74	Organometallics	HCAPLUS
White, C	1992	29	1228	Inorg Synth	HCAPLUS
Xie, Y	2005	5	17473	Cryst Growth Des	HCAPLUS

L49 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2009:998278 HCAPLUS Full-text

DOCUMENT NUMBER: 151:448539

TITLE: Extending Rectangular Metal-Organic Frameworks to the Third Dimension: Discrete Organometallic Boxes for Reversible Trapping of Halocarbons Occurring with Conservation of the Lattice

AUTHOR(S): Han, Ying-Feng; Jia, Wei-Guo; Lin, Yue-Jian; Jin, Guo-Xin

CORPORATE SOURCE: Shanghai Key Laboratory of Molecular Catalysis and Innovative Material, Department of Chemistry, Fudan University, Shanghai, 200433, Peop. Rep. China

SOURCE: Angewandte Chemie, International Edition (2009), 48(34), 6234-6238, S6234/1-S6234/32

CODEN: ACIEF5; ISSN: 1433-7851

PUBLISHER: Wiley-VCH Verlag GmbH &amp; Co. KGaA

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Open-channel structures comprised of organometallic rectangular building blocks were prepared and shown to selectively recognize CH<sub>2</sub>C<sub>12</sub> and ClCH<sub>2</sub>CH<sub>2</sub>Cl mols. while retaining of single crystallinity. E.g., tetrานuclear complexes [Cp\*<sup>4</sup>M<sub>4</sub>( $\mu$ -pyrazine)<sub>2</sub>( $\mu$ -L)<sub>2</sub>](OTf)<sub>4</sub> [M = Ir (3a), Rh (3b), L = dhmq<sub>2</sub>, H<sub>2</sub>dhmq = 6,11-dihydroxy-5,12-naphthacenedione] were prepared and characterized by x-ray crystallogr.; 3a was shown to incorporate two CH<sub>2</sub>C<sub>12</sub> guest mols. at the walls of the cavity under a mixed-solvent solution of CH<sub>3</sub>OH/CH<sub>2</sub>C<sub>12</sub>. These complexes underwent reversible SCSC structural transformations that were induced by solvent exchange.

IT 1190934-90-7P

(crystal structure; open-channel host structures of Ir and Rh organometallic rectangular boxes were prepared and selectively and reversibly trapped halocarbons guest mols. with conservation of the lattice)

RN 1190934-90-7 HCAPLUS

CN INDEX NAME NOT YET ASSIGNED

CM 1

CRN 1190934-89-4

CMF C40 H46 Ir2 O6  
CCI CCS

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 37181-39-8  
CMF C F3 O3 S



IT 1190934-87-2

(open-channel host structures of Ir and Rh organometallic rectangular boxes were prepared and selectively and reversibly trapped halocarbons guest mols. with conservation of the lattice)

RN 1190934-87-2 HCPLUS

CN INDEX NAME NOT YET ASSIGNED

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CC 29-13 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 22, 75

IT 1190934-90-7P 1190934-92-9P 1190935-26-2P  
(crystal structure; open-channel host structures of Ir and Rh organometallic rectangular boxes were prepared and selectively and reversibly trapped halocarbons guest mols. with conservation of the lattice)

IT 290-37-9, Pyrazine 553-26-4, 4,4'-Dipyridyl 1785-52-0 12354-84-6  
12354-85-7 13362-78-2 1190934-87-2 1190934-88-3  
(open-channel host structures of Ir and Rh organometallic rectangular boxes were prepared and selectively and reversibly trapped halocarbons guest mols. with conservation of the lattice)

RETABLE

Referenced Author (RAU)	Year (R PY)	VOL (R VRL)	PG (R PG)	Referenced Work (R WK)	Referenced File
Sheldrick, G	1997			SHELXL-97	
Sluis, P	1990	A46	194	Acta Crystallogr	
White, C	1992	29	228	Inorg Synth	HCPLUS
OS.CITING REF COUNT:	5	THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)			

L49 ANSWER 3 OF 5 HCPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2008:1042787 HCPLUS Full-text

DOCUMENT NUMBER: 149:307972

TITLE: Electroluminescent cyclometalated

2-aryl-2H-benzotriazole metal complexes

INVENTOR(S): Schaefer, Thomas; Murer, Peter; Baudin, Gisele; Kocher, Manuela; Maike, Francois; Allenbach, Stephan; Sift, Rosemarie; Schmidhalter, Beat

PATENT ASSIGNEE(S): Ciba Holding Inc., Switz.

SOURCE: PCT Int. Appl., 105pp.

CODEN: PIXXD2

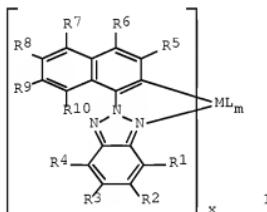
DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008101842	A1	20080828	WO 2008-EP51702	20080213
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
EP 2112994	A1	20091104	EP 2008-708928	20080213
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR				
KR 2009118071	A	20091117	KR 2009-719823	20080213
CN 101631793	A	20100120	CN 2008-80006073	20090824
PRIORITY APPLN. INFO.:			EP 2007-102949	A 20070223
			WO 2008-EP51702	W 20080213

OTHER SOURCE(S):

MARPAT 149:307972

GI



AB Cyclometalated 2-aryl-2H-benzotriazole metal complexes [L1xMLm], shown as I (1, M = metal having atomic weight >40, preferably M = Ir, Rh, Re, Pt, Pd, most preferably M = Ir; x = 1-3, m = 0-4; R1-R10 = H, organyl, F, two adjacent Rn may form (hetero)areno cycle, preferably R5-R6 = benzo, or R1, R4, R5, R7-R10 = H; L = anionic mono- or bidentate ligand, preferably L = acetylacetato picolinate, salicylaldimato, 8-quinolinolato, dipivaloylmethanato, 2-phenylpyridinato, m = 0-2), useful as dopants for red- and orange-emitting electroluminescent devices, were prepared either by one-pot cyclometalation of

the corresponding benzotriazole proligands HL1 by IrCl<sub>3</sub>·nH<sub>2</sub>O in the presence of CF<sub>3</sub>CO<sub>2</sub>Ag, which gives the preferred homoleptic complexes [L1<sub>3</sub>Ir] (5b, shown as I, x = 3, m = 0, same R, M = Ir), or by a two-step procedure by reacting of IrCl<sub>3</sub>·nH<sub>2</sub>O with a proligands HL1 to give chloro-bridged dimers [L1<sub>4</sub>Ir<sub>2</sub>( $\mu$ -Cl)<sub>2</sub>], which upon complexation with proligands HL give preferred heteroleptic complexes I (5a, x = 2, m = 1, same L, R, M = Ir; 5c, x = 2, m = 2, L = monodentate ligand, same R, M = Ir). The fabrication of the electroluminescent devices, comprising light-emitting layers containing at least 1% of the complexes I, is also described. In an example, the proligand HL, 2-(1-naphthalenyl)-2H-benzotriazole, was prepared in three steps by azo-coupling of 2-naphthalenol with 2-nitroaniline, followed by heterocyclization into 2-(2-hydroxy-1-naphthalenyl)-2H-benzotriazole, esterification with Tf<sub>2</sub>O and Pd(OAc)<sub>2</sub>/PPh<sub>3</sub> reduction by HCO<sub>2</sub>H with 85% yield. In another example, cyclometalation of 2-(1-naphthalenyl)-2H-benzotriazole by IrCl<sub>3</sub> hydrate gave the dimeric chloro-bridged complex [L1<sub>4</sub>Ir<sub>2</sub>( $\mu$ -Cl)<sub>2</sub>] [L1 = 1-(2H-benzotriazol-2-yl- $\kappa$ N1)-2-naphthalenyl- $\kappa$ C], which upon the reaction with 2,4-pentanedione gave the complex I, [L1<sub>2</sub>Ir(acac)] [same L1, acac = 2,4-pentanedionato(1-)]. The invention also relates to electronic devices comprising the metal complexes I and their use as oxygen sensitive indicators, as phosphorescent indicators in bioassays, and as catalysts.

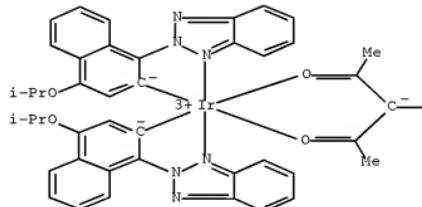
IT 1050407-73-2P 1050583-34-0P

(preparation of red- and orange-luminescent iridium cyclometalated 2-aryl-2H-benzotriazole complexes as components for organic electroluminescent devices)

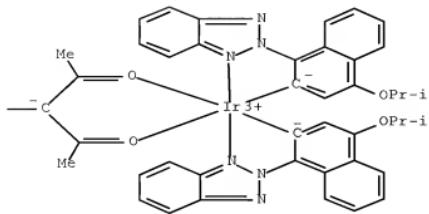
RN 1050407-73-2 HCAPLUS

CN Iridium, tetrakis[1-(2H-benzotriazol-2-yl- $\kappa$ N1)-4-(1-methylethoxy)-2-naphthalenyl- $\kappa$ C] [ $\mu$ -{3, 4-di(acetyl- $\kappa$ O)-2, 5-hexanedionato(2-)- $\kappa$ O2: $\kappa$ O5}]di- (CA INDEX NAME)

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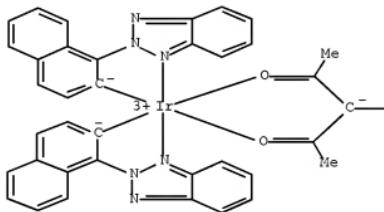
PAGE 1-B



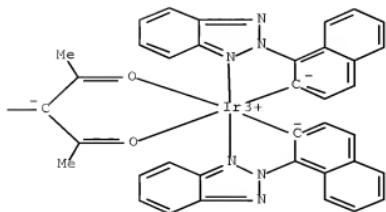
RN 1050583-34-0 HCPLUS

CN Iridium, [ $\mu$ -[3,4-di(acetyl- $\kappa$ O)-2,5-hexanedionato(2-)- $\kappa$ O2: $\kappa$ O5]tetraakis[1-[(trifluoromethyl)-2H-benzotriazol-2-yl- $\kappa$ N1]-2-naphthalenyl- $\kappa$ C]di- (CA INDEX NAME)

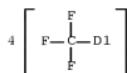
PAGE 1-A



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PAGE 2-A



CC 29-13 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 28, 73, 76

IT	1050404-47-1P	1050404-50-6P	1050404-53-9P	1050404-55-1P
	1050404-57-3P	1050404-59-5P	1050404-60-8P	1050404-63-1P
	1050404-65-3P	1050404-68-6P	1050404-69-7P	1050404-72-2P
	1050404-74-4P	1050404-76-6P	1050404-77-7P	1050404-81-3P
	1050404-83-5P	1050404-84-6P	1050404-86-8P	1050404-88-0P
	1050404-91-5P	1050404-93-7P	1050404-95-9P	1050404-98-2P
	1050405-01-0P	1050405-03-2P	1050405-05-4P	1050405-08-7P
	1050405-10-1P	1050405-12-3P	1050405-14-5P	1050405-17-8P
	1050405-20-3P	1050405-22-5P	1050405-26-9P	1050405-28-1P
	1050405-29-2P	1050405-31-6P	1050405-35-0P	1050405-36-1P
	1050405-38-3P	1050405-39-4P	1050405-43-0P	1050405-45-2P
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	1050583-36-2P	1050583-38-4P	1050583-40-8P	

(preparation of red- and orange-luminescent iridium cyclometalated 2-aryl-2H-benzotriazole complexes as components for organic electroluminescent devices)

RETABLE

Referenced Author (RAU)	Year   VOL   PG   Referenced Work (R PY)   (R VL)   (R PG)   Referenced Work (R WK)   File
----------------------------	--

Ciba Sc Holding Ag |2006 | |WO 2006000544 A |HCAPLUS  
 Takasago Perfumery Co L|2006 | |IBG 2423518 A |HCAPLUS

L49 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2005:672680 HCAPLUS Full-text  
 DOCUMENT NUMBER: 143:182853  
 TITLE: Dual emitting dyads of heavy metal complexes as  
       broad band emitters for organic LEDs  
 INVENTOR(S): Thompson, Mark E.; Ma, Biwu; Djurovich, Peter  
 PATENT ASSIGNEE(S): USA  
 SOURCE: U.S. Pat. Appl. Publ., 37 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050164031	A1	20050728	US 2004-807739	20040324
WO 2005073341	A1	20050811	WO 2005-US2050	20050121
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG				
PRIORITY APPLN. INFO.:			US 2004-539210P	P 20040126
			US 2004-807739	A 20040324

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 143:182853

AB Compds. which comprise a first metal center and a second metal center, wherein each metal has an atomic weight >40; and a bridging ligand coordinated to the first metal center and the second metal center; and ≥1 photoactive ligand bound to the first metal center, and ≥1 photoactive ligand bound to the second metal center are described in which the transition dipole moment of the first photoactive ligand is orthogonal to the transition dipole moment of the second photoactive ligand. Compds. are also described in which the first metal center and the atoms of the bridging ligand that are coordinated to the first metal center define a first plane, and the second metal center and the atoms of the bridging ligand that are coordinated to the second metal center define a second plane, and wherein the first plane and the second plane form an angle that is between about 80° and 100°. Organic light-emitting devices are also described which are provided with emitting layers incorporating the compds.

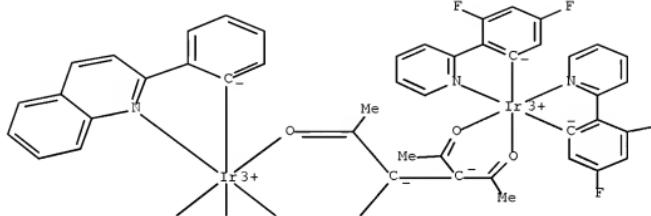
IT 861146-02-3 861146-10-3  
 (dual emitting dyad heavy metal complexes and organic light-emitting  
 devices using them)

RN 861146-02-3 HCAPLUS

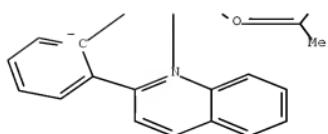
CN Iridium, [μ-[3,4-di(acetyl-κO)-2,5-hexanedionato(2-)-  
 κO:κO']]bis[3,5-difluoro-2-(2-pyridinyl-κN)phenyl-

$\kappa$ C]bis[2-(2-quinolinyl- $\kappa$ N)phenyl- $\kappa$ C]di- (9CI) (CA  
INDEX NAME)

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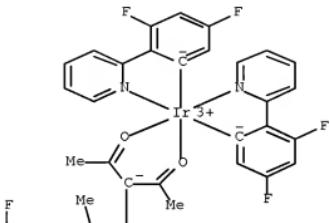
 $\longrightarrow$  F

PAGE 2-A

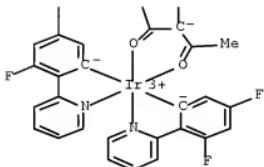
RN 861146-10-3 HCAPLUS

CN Iridium, [ $\mu$ -{3,4-di(acetyl- $\kappa$ O)-2,5-hexanedionato(2-)- $\kappa$ O: $\kappa$ O'}]<sub>4</sub>tetrakis[3,5-difluoro-2-(2-pyridinyl- $\kappa$ N)phenyl- $\kappa$ C]di- (9CI) (CA INDEX NAME)

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IC ICM H05B0033-14  
ICS C09K0011-06

INCL 428690000; 428917000; 313504000; 549003000; 546004000; 546010000  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties).

Section cross-reference(s): 29, 76

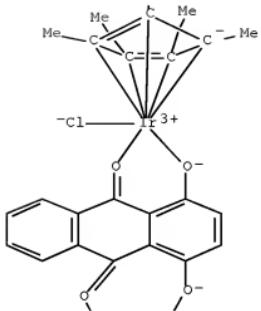
IT 861145-92-8 861145-94-0 861145-96-2 861145-98-4 861146-00-1  
861146-02-3 861146-04-5 861146-06-7 861146-08-9

1146-09-0 861146-10-3 861146-11-4  
(dual emitting dyad heavy metal complexes and organic light-emitting

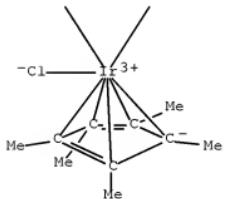
OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

L49 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 1998:34456 HCAPLUS Full-text  
DOCUMENT NUMBER: 128:135753  
ORIGINAL REFERENCE NO.: 128:26517a,26520a  
TITLE: Metal complexes of dyes. Part 10. New transition metal complexes of anthraquinone dyes  
AUTHOR(S): Kuehlwein, Frank; Polborn, Kurt; Beck, Wolfgang  
CORPORATE SOURCE: Institut Anorganische Chemie, Ludwig-Maximilians-Universitaet, Munich, D-80333, Germany  
SOURCE: Zeitschrift fuer Anorganische und Allgemeine Chemie (1997), 623(12), 1931-1944  
CODEN: ZAACAB; ISSN: 0044-2313  
PUBLISHER: Johann Ambrosius Barth  
DOCUMENT TYPE: Journal  
LANGUAGE: German  
AB The chloro-bridged compds. [(R3P)MC12]2 (M = Pd, Pt; R = Et, Ph, Bu), [(Ph3P)2PdCl]2(BF4)2, [(\eta<sub>5</sub>-C5Me5)MC12]2 (M = Rh, Ir), [(\eta<sub>6</sub>-p-cymene)RuCl2]2, [(\eta<sub>5</sub>-C5H<sub>5</sub>)Fe(\eta<sub>5</sub>-C5H<sub>3</sub>)CH2N(CH<sub>3</sub>)<sub>2</sub>PdCl]2 react with mono- and dianions of several 9,10-anthracenedione dyes [1-amino-9,10-anthracenedione, Disperse Blue 19 (1-amino-4-anilino-9,10-anthracenedione), 1,4-diamino-9,10-anthracenedione, Solventgreen 3 [1,4-bis(4'-methylanilino)-9,10-anthracenedione], dianthrimide [1,1'-dianthraquinonylamine], 1-azo-β-naphthol-9,10-anthracenedione, 1-anilido-o-carboxy-9,10-anthracenedione and quinizarin (1,4-dihydroxy-9,10-anthracenedione)] to give N,O-, O,O- and O,N,O-chelate complexes. Cu(II)- and Pd(II) acetate and the anion of 1-aminoanthraquinone afford N,O-bischelates. Spectroscopic data are discussed. In comparison to the free anthraquinones the dye complexes show a bathochromic shift in the UV/VIS spectra. The structures of Et<sub>3</sub>P(C<sub>1</sub>)Pt(1-aminoanthraquinone-H<sup>+</sup>), (\eta-C<sub>5</sub>Me<sub>5</sub>)(Cl)Ir(1-azo-β-naphtholanthraquinone-H<sup>+</sup>) and (\eta-C<sub>5</sub>Me<sub>5</sub>)Rh(1-anilido-o-carboxyanthraquinone-2H<sup>+</sup>) were determined by XRD.  
IT 201941-76-6P  
(preparation and NMR)  
RN 201941-76-6 HCAPLUS  
CN Iridium, dichloro[μ-[1,4-di(hydroxy-κO)-9,10-anthracenedionato(2)-κO:κO']]bis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]di- (9CI) (CA INDEX NAME)

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CC 78-7 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 29, 41, 75

IT	201941-57-3P	201941-58-4P	201941-59-5P	201941-60-8P
	201941-62-0P	201941-63-1P	201941-64-2P	201941-68-6P
	201941-69-7P	201941-70-0P	201941-71-1P	201941-72-2P
	201941-74-4P	201941-76-6P	201941-78-8P	201941-83-5P
	201941-87-9P	201941-88-0P	201941-89-1P	201941-90-4P
	201941-92-6P	201941-93-7P	201941-95-9P	202007-95-2P
	202007-96-3P			
	(preparation and NMR)			